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指導教員 承認印	
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## 学位 (博士) 論文要旨

(Doctoral thesis abstract)

論文提出者 (Ph. D. candidate)	工学府博士後期課程 電子情報工学 専攻 (major) 平成 27 年度入学 (Admission year) 学籍番号 15834703 氏名 GAO XUDONG (高 旭東) (student ID No.) (Name) (Seal)
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論文題目 (Title)	Operator-based robust nonlinear control of uncertain wireless power transfer systems (オペレータ理論に基づく不確かさを有するWPTシステムのロバスト非線形制御)
論文要旨 (2000 字程度) (Abstract(400 words))	<p style="text-align: center;"><b>ABSTRACT</b></p> <p>This dissertation provides the operator-based robust nonlinear control design schemes for uncertain wireless power transfer (WPT) systems which is driven by the switch.</p> <p>Firstly, a robust nonlinear control method is proposed to tackle the uncertain mutual inductance using sliding mode control method, the operator-based right coprime factorization is adopted to guarantee the robust stability of the feedback nonlinear system. Simulations and experiments are tested to verify its effectiveness. Secondly, a new operator-based nonlinear robust control design scheme for WPT systems with uncertainties is proposed, where, from different viewpoint, the considered nonlinear system was of Input-Output presentation. The robust stability can be guaranteed by using operator-based robust right coprime factorization approach. Moreover, the tracking performance is improved by using the proposed control design scheme. Simulations and experiments are tested to verify its effectiveness. Thirdly, an operator-based optimal equivalent load tracking control scheme is proposed for WPT systems with uncertainties. In this control design system, the robust stability of the feedback nonlinear control system is guaranteed by using robust right coprime factorization approach. Especially, the impedance matching of the WPT system could be obtained, thus high efficiency can be obtained. Moreover, the desired output voltage can be obtained in the WPT system. The effectiveness of the proposed control schemes is confirmed by using simulations.</p>